

**Copier of the Future
Technology Procurement Project**



Procurement Documentation

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1.0 Introduction

Annexe III of the International Energy Agency's DSM Program is a pilot project aiming toward the development of a multinational technology procurement process to speed the introduction and dissemination of energy-efficient products. By working together, leading purchasers can influence production choices and steer manufacturers towards improving the environmental performance of their products. By working internationally, the project managers help to encourage the dissemination of common energy efficiency technologies to customers in all participating countries. Annexe III promotes and supports the creation of such buyer groups.

The photocopier procurement is one of several projects within Annexe III focused on bringing buyers and sellers together. Copiers were selected as a pilot project in an effort to spur the introduction of new technology that will offer digital copying and network connectivity, faster duplex copying, increased user convenience, and at the same time reduce the energy consumed by copiers in their idle periods. While energy efficiency is important to the leading buyers in the copier procurement, they are also interested in reliable, convenient copying. In order to satisfy those performance requirements and to spur the broader market acceptance of copiers that meet the specifications, the project requirements include both energy and additional performance requirements.

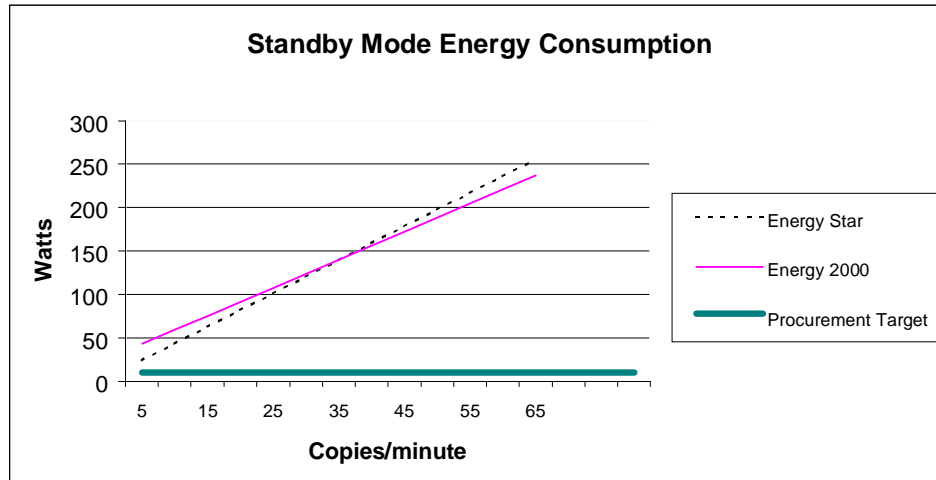
It is expected that innovative technologies developed in response to the Copier of the Future procurement will reduce energy consumption in photocopiers by about 75%. It is also anticipated that the technology can be adapted to other imaging products, thereby reducing energy consumption in office buildings even further. The specifications for this project are based on a technical feasibility study, with the cooperation of leading product designers and manufacturers.

Leading buyers from each of the participating countries have expressed interest in purchasing highly energy efficient photocopiers. This project is intended to match those buyers with suppliers of efficient copiers, and to provide opportunities for public recognition of the manufacturers who meet the specifications.

2.0 Photocopiers and Energy Consumption

Office equipment is estimated to consume about 7% of all electricity in the commercial sector, and the growing demand for computers and connected devices indicates that electricity consumption will continue to increase. Photocopiers alone account for over 10% of office equipment electricity demand, and more than 90% of that energy is consumed when copiers are not being used¹. In addition, the energy used to manufacture the paper used in copiers — about the same as the copiers' direct energy consumption — adds to the total energy bill. Therefore, copiers are an important product to target for efficiency improvements, while ensuring that the essential features perform well.

¹ Derived from Koomey, J. et al, "Efficiency Improvements in U.S. Office Equipment: Expected Policy Impacts and Uncertainties," December 1995. LBL-37383.



Some energy labeling programs already have encouraged efficiency gains in photocopiers, but substantial room for technology improvement remains. For example, the U.S. EPA's ENERGY STAR copier program and the Swiss Energy 2000 program base the allowable energy consumption for the low-power states on the speed of the copier, and qualified medium-speed copiers may consume over 200 Watts, even in their energy saving states. In addition to the potential for energy savings, technical improvements are required in order to meet user requirements for fast recovery from low-energy modes. At this time, medium speed copiers may take a minute or more to reach a ready state from an energy saving mode, leading inconvenienced office workers to disable the energy saving modes entirely.

In addition to the potential energy savings over current labeling programs, the specifications have been designed to incorporate users' interest in convenient copying. For example, even from its very low energy state, the Copier of the Future will be ready to copy in 10 seconds or less. Further, unlike many copiers which offer fast copying in single-sided mode but slow down to less than half-speed in duplex mode, this copier will offer duplexing that is nearly as fast as the simplex mode. This means that users can make duplex their copying mode of choice, saving paper and the associated purchasing costs.

The goal of this technology procurement is to speed the introduction of new copier technologies that can improve energy efficiency, meet users' expectations for copying speed, quick recovery and convenience, and be adapted to other imaging products. This procurement will stimulate the introduction of innovative fusing technology two years earlier than otherwise might take place, worldwide energy savings could reach 1.5 to 15 TWh each year for a period of up to 10 years (actual savings depend on market penetration, use pattern of current copiers, and the diffusion of the technology to mainstream office imaging products).²

Energy efficiency improvements can help to prevent air pollution by reducing the demand on electricity generation capacity. Most of the world's energy supply is provided through the combustion of fossil fuels. When these fuels — oil, coal, and gas — are burned, air pollutants

² Aebischer, Bernard. "Co-operative Procurement of Innovative Copiers: Facts and Arguments for Buyers", IEA DSM Agreement, Annex III Co-operative Procurement, ETH Zurich, November 22, 1996.

such as CO₂, NO_x, and SO_x are released into the atmosphere. These pollutants are contributors to global warming, urban smog, and acid rain.

In addition to the environmental benefits accruing from energy efficiency, improvements in the efficient use of paper can lead to additional environmental gains and cost savings. Today's copiers typically each use 1.2 million sheets of paper over their lifetimes — a stack of paper 120 meters high. About 10 times more energy is required to manufacture a sheet of paper than to copy an image onto it. The forest resources required to produce this much paper equate to a forest of about 300 m². By reducing paper consumption, businesses can save significant amounts of money and save the resources used to manufacture paper. The Copier of the Future project is intended to lead to improvements in paper handling technology that will allow businesses to copy duplex (2-sided) images and use digital technology to scan multiple images onto a single side of paper.

3.0 Definitions

Counters: Mechanisms that record the number of images copied and/or sheets of paper used. By combining the data provided by imaging and paper counters, the number of simplex and duplex copies can be calculated. The purpose of the counters is to allow users to track paper and imaging use for internal accounting or other purposes.

Paper Compatibility: Paper compatibility specifications require the copier to function fully in all modes (simplex, duplex) with no reduction in performance when using the primary paper tray, primary document feeder, and duplex unit. That is, the rate of paper jamming or service requirements should not be increased due to use of paper with specified characteristics for recycled-content and weight.

Recovery Time: The time it takes for the machine to reach its ready to copy state starting in zero-energy standby (sleep) mode. Recovery time is calculated by measuring the time required for a copier to make its first copy from ZESM (sleep), then subtracting the manufacturer's rating of first copy out time.

Sleep Mode: The lowest energy consuming state that the copier enters without turning off completely. In a sleep mode, the machine should be able to receive input through either direct physical intervention or network signals (for those copiers enabled with a network connection). For this project, sleep mode is the same as "Zero Energy Standby Mode."

Standby Mode: The state of the copier when it is plugged in, turned on and ready to make copies, but not actively copying. In the case of the Copier of the Future, it is intended that the standby or ready mode be nearly indistinguishable to the user from a sleep mode, eliminating the need for additional energy saving modes.

Zero Energy Standby Mode (ZESM): A mode in which the copier's fuser reaches a zero energy consumption state when the copier is inactive. Like a conventional standby mode, the copier is instantly (or nearly instantly) ready to make copies. A minimal amount of energy is consumed in ZESM to maintain electronic functions such as timers, counters, and memory functions. In the case of the Copier of the Future, ZESM is equivalent to sleep mode.

4.0 Technical Background

4.1 Energy Consumption in Today's Photocopiers

Most photocopiers on the market today, whether digital or analog, create a hard copy image by fusing toner to a sheet of paper by using heat or pressure (or both). When a medium-speed copier is turned on, it typically takes 30 seconds to 6 minutes for the fusing device to reach its operating temperature. Without any energy saving features, a copier will remain at or near this fusing temperature (130° – 200° C) the entire time it is on, consuming considerable amounts of energy and also causing excessive wear to some temperature sensitive components. A medium speed copier that spends all of its time on and at full operating temperature might consume over 1,600 kWh each year.

Even photocopiers designed to achieve energy saving modes during their idle periods must limit the energy savings in order to meet user requirements. If the energy consumption of a typical copier is reduced too much, the temperature of the fuser will drop, and it will take a long time for the copier to recover to its ready state. In order to limit the user inconvenience caused by long recovery times, the low power modes of the ENERGY STAR and Energy 2000 labels allow for up to 120 – 220 Watts for medium speed copiers. With this low-power mode enabled, a medium-speed copier that is seldom shut off can consume 900 – 1,600 kWh per year. Further, some copiers take a noticeable amount of time to their ready state from these low-power modes. This inconvenience may cause some users to completely disable the energy saving features on their copiers.

The specifications in this call for entries are designed to address the technical challenge of designing a photocopier fuser that can quickly reach its operating temperature, eliminating both excess energy consumption and user inconvenience. In particular, the specifications are based on Zero Energy Standby Mode (ZESM), meaning that the fuser can be completely turned off, with energy required only to maintain electronic functions such as counters, network connections, or timers. The technical challenge of merging ZESM with instant (no more than 10 seconds) recovery has been achieved to date only in the low speed (< 20 cpm) copier segments. By targeting the medium speed range, this procurement is designed to draw new technologies into the fastest growing sector of the copier market, with the greatest potential for energy savings.

A copier meeting the Copier of the Future specifications, in contrast to conventional and energy saving copiers noted above, would consume only 120 - 310 kWh per year, depending on actual copying and the speed of the machine, savings of 75 – 85% over the current energy efficient copiers on the market.

4.2 Technical Feasibility

The specifications are based in large part on technical analyses of the feasibility of technology to meet the requirements and of energy savings improvements over copiers currently on the market.

The study, *Feasibility of Zero Energy Standby Mode (ZESM) for Electrophotographic Engines with Copy Speed in the Range of 20 to 40 Copies per Minute or Higher*, provides an overview of the fusing technologies currently on the market and an analysis of how those might be adapted to achieve ZESM with instant recovery in the medium speed segment. The study is accompanied by a patent search and discussions with manufacturers about the technical feasibility of attaining ZESM in the medium speed copying range.

4.3 Energy Savings Potential of the Copier of the Future

This discussion addresses the potential energy savings of copiers that might be produced under the IEA-DSM Annex III effort. This paper illustrates the overall approach of estimating potential savings. See the more detailed discussion enclosed for further details and background. Key factors include:

The energy use of the copiers that such copiers would replace³.

These are assumed to be ordinary ENERGY STAR copiers, which are expected to have penetrated most of the market by the time copiers meeting the IEA-DSM specifications are introduced. We estimate that the copiers being replaced will reflect some disabling of power management and default duplex, based on observed copier operating patterns.

The imaging rate and average job size presumed.

For a conventional copier, the amount of copying has only a modest effect on copier electricity use; the bulk of electricity is used in non-copying modes. However, for IEA-DSM copiers, the imaging rate (images/month) has a large effect; if the recovery energy is large, the number of times the copier has to recover from its sleep state also has a large effect on energy use.

The energy profile of “IEA-DSM” copiers.

With no extant Copier of the Future to study, this is necessarily somewhat speculative, but as manufacturers gain experience with the necessary technologies, some assumptions may be revisited.

Machines with multi-function capabilities such as printing will have a network connection and other electronics that may add to the electricity use in active and low-power modes. However, this also would be true for a conventional machine and is covered by the 10 Watt limit. Thus, we do not add energy use for electronics in estimating savings. The IEA-DSM project emphasizes the energy consumption of the fusing unit.

The energy estimates are for two speed ranges by rated copies per minute: 30-44 cpm and 45-60 cpm. We consider a variety of imaging rates and average job sizes. A recent LBNL study⁴ provided estimated annual electricity use for the three speed ranges.

³ By “replace” we mean the new copier that is displaced by the IEA copier, *not* the old machine that is being retired.

⁴ Nordman, Bruce, Mary Ann Piette, Brian Pon, and Kris Kinney, “Its Midnight: Is Your Copier On?: ENERGY STAR Copier Performance”, prepared for the U.S. EPA, Lawrence Berkeley National Laboratory, 1998, LBL-41332.

The current effect of the ENERGY STAR program is considerably smaller than its potential due to the large portion of compliant copiers with power management partially or entirely disabled. We do not assume any change in these disabling rates for the ‘replaced’ copiers, and assume no disabling of features in IEA-DSM copiers. For power management we expect that the savings are inherent and cannot be disabled. For paper features, user education will be required to forestall disabling.

With the uncertainty in the energy profile of IEA-DSM copiers, we present two savings scenarios: one ‘optimistic’ and the other ‘conservative’. Table 4.1 shows the “most likely” cases for both scenarios. Table 4.2 shows the annual energy use figures behind the savings. Key assumptions and rationales for the specific values are discussed in the Appendix.

Assuming a five year life for the copier, the total savings for the two speed categories is respectively \$440-1,290, and \$900-2,360 depending on the scenario and costs. This does not discount the value of future benefits but does also not account for added benefits such as reduced cooling requirements in buildings, or other paper savings.

Table 4.1: IEA-DSM Annual Savings (electricity values are *kWh/year*)

	Optimistic				Conservative			
	30 - 44 cpm		45 - 60 cpm		30 - 44 cpm		44 - 60 cpm	
	<i>Elec.</i>	<i>Savings</i>	<i>Elec.</i>	<i>Savings</i>	<i>Elec.</i>	<i>Savings</i>	<i>Elec.</i>	<i>Savings</i>
Electricity	750	\$60 - 113	1,490	\$120 - 224	640	\$51 - 96	1,350	\$108 - 203
Paper	230	\$72 - 144	460	\$144 - 288	120	\$36 - 72	230	\$72 - 144
Total	980	\$132 - 257	1,950	\$264 - 472	760	\$87 - 168	1,580	\$180 - 347

Notes. The electricity cost used is \$0.08-0.15/kWh; the paper cost is \$0.005-0.01/sheet; and paper energy is 16 Wh/sheet.

Table 4.2: Annual Electricity Use Estimates

Electricity values are <i>kWh/year</i>	30 - 44 cpm		45 - 60 cpm	
	<i>Elec.</i>	<i>Savings</i>	<i>Elec.</i>	<i>Savings</i>
<u>ENERGY STAR</u> : That observed by ENERGY STAR copiers used as-is (with the features sometimes disabled)	870	\$70 - 131	1,660	\$133 - 249
<u>Copier of the Future Electricity Use</u> : Optimistic	120	\$10 - 18	170	\$14 - 26
<u>Copier of the Future Electricity Use</u> : Conservative	230	\$18 - 35	310	\$25 - 47

Notes. Copying energy is the same for all the scenarios and is included in the totals. The imaging rates are those used in the ASTM tests. The electricity cost used is \$0.08-0.15/kWh.

5.0 Project Specifications

The energy and other performance requirements outlined in these specifications were designed to stimulate the introduction of energy efficient photocopiers into new speed segments. Non-energy performance attributes were designed in consultation with leading buyers in order to balance users' demand for energy efficient copiers with their requirements for reliable, convenient copying. While the specifications have been designed primarily for black & white copiers, color copiers that meet the specifications may qualify for participation. The specifications do not include requirements for price or image quality, but is expected that participating manufacturers will offer equal or superior image quality at competitive prices in order to achieve long-term success in the market.

Speed (monochrome, A4 or 8.5" x 11")	≥30 cpm
Sleep mode (ZESM) power	#10W ⁵
Default time to sleep mode	# 10 seconds
Recovery time from sleep mode	#10 seconds
Duplex speed (as % of simplex speed)	≥75%, 80%, 85%, 90% ⁶
Duplexing unit	Standard
Duplex copying mode	Default ⁷
Duplex-compatible document feeder	Standard
Counter: number of images	Standard
Counter: number of duplex images (or sheets of paper)	Standard
Paper compatibility	≥25% recycled-content; ≥70 g/m ² (18 lb.)
Network Compatible	Standard ⁸

⁵ Sleep mode energy is allotted to include electronic functions, such as memory, counters, etc, and accessories such as sorters and finishers.

⁶ Percent of simplex speed for 30, 40, 50, 60 cpm. For example, this means that a 30 cpm copier is required to have a duplex speed of #22.5 cpm, a 40 cpm copier must have a duplex speed of #32 cpm, a 50 cpm copier must have a duplex speed of 42.5 cpm, and a 60+ cpm copier must have a duplex speed of #54 cpm.

⁷ Automatic duplex shall be the default setting for the machine. Manufacturers' salesperson or dealer should inform customers of this feature at installation. The default setting may be changed in response to the customer's request.

⁸ Network connections should be maintained even in ZESM/sleep mode; data signals from the network or walk-up interaction should stimulate recovery from sleep mode.

6.0 Test Methods

In order to ensure fair and objective evaluation of manufacturers' submissions for the Copier of the Future Procurement Project, the project team has established test methods for evaluating the copiers. These test methods are based on broadly recognized industry standards wherever feasible, and in most cases, would be required to market the copiers even in the absence of the procurement project. The required tests cover:

- X Copier speed (simplex and duplex);
- X Sleep mode (ZESM) energy consumption;
- X Recovery time.

Manufacturers participating in the procurement project may either conduct their own testing in internal facilities or obtain test results from a qualified independent testing facility. Regardless of the testing facility, manufacturers must submit test results for all required tests to the jury (see section 7.2, Submission of Entries).

Test Conditions

The prototypes should be tested according to the conditions (voltage, frequency) of the intended end market. Therefore, for U.S. buyers, manufacturers shall ensure that their products meet the specifications at 120V, 60 Hz; for European buyers, the products must meet the specifications at 230V and 50 Hz; products destined for Japanese and Korean markets would be tested at 100V and 50 Hz/60 Hz and at 200V and 50 Hz/60 Hz. If the copier will be marketed in multiple end markets, test results should be provided for all relevant conditions.

6.1 Test Method: Copier Simplex and Duplex Speed

Manufacturers shall use a subset of the ASTM *Standard Test Method for Determination of Productivity Using Electrostatic Copy Machines* (ASTM F 1318) in order to document copier speed in both simplex and duplex modes. The test shall be conducted in the default modes for the copier. That is, for a standard size copier, the test should be conducted in monochrome mode, at standard resolution (if several options are available), with standard letter sized paper (A4 or 8.5" x 11").

For the purposes of qualifying simplex copier speed for the Copier Procurement Project, manufacturers need to document only the results of the productivity test for ten copies of an original consisting of 10 sheets in 1:1 mode. For duplex mode, manufacturers also need to provide only the results for ten copies of an original of 10 sheets in 1:2 mode (therefore, each of the resulting ten copies will consist of only five sheets).

Specifically, manufacturers (or their qualifying laboratories) shall undertake test preparation as outlined in Sections 1 - 8 of the ASTM test, using originals with standard 4 - 6% coverage. Then, manufacturers shall conduct the test as outlined in Procedure A: Method for Measuring Machine

Productivity as outlined in the test. To determine simplex copier speed, manufacturers shall perform the calculations according to the method described in Section 9.5.6, however, they shall make ten copies rather than five copies of the ten page original. To determine duplex copier speed, manufacturers shall perform the calculations in Section 9.6.6, but again shall make ten copies rather than five copies in 1:2 mode of a ten page original.

Manufacturers shall report the copier speed for both simplex and duplex modes, calculated as $cpm = 60 \text{ seconds} / (\text{total job time}/\text{number of images})$. For example, if the test resulted in taking a total of 200 seconds to make the 10 single-sided sets of 10 originals, the resulting copier speed would be $[60 \text{ seconds} / (200 \text{ seconds}/100 \text{ images})] = [60/2]$, or 30 cpm.

6.2 Test Method: Sleep Mode (ZESM) Energy Consumption

This standby mode power consumption test method is based on ASTM Test F757-94. However, due to lack of clarity about terms such as standby and energy-saver modes, this variation is presented.

Manufacturers should measure the average power consumption of their copier products when in the zero energy standby (sleep) mode. This should be done by measuring the energy consumption over a 1-hour period. The resulting energy consumption can be divided by 1 hour to calculate average Watts.

The copier shall be turned on for two hours and allowed to reach full fusing temperature. After two hours, make 10 copies (single-sided) of a one-page original. Ten seconds after the last copy reaches the finished document tray, read and record the watt-hour meter indication and the time (or start the stopwatch or timer). After 1 hour, read and record the watt-hour indication again. The difference between the two readings of the watt-hour meter is the energy consumption in ZESM (sleep mode). Divide by 1 hour to obtain the average power rating.

6.3 Test Method: Recovery Time

Recovery time is the time required for the copier to reach its ready state from its sleep mode. Due to the difficulty of determining, based on visual observation, the exact moment the copier reaches its ready state, recovery time is derived from the total of recovery and first copy times. Recovery time is calculated by measuring the total time from sleep mode to first copy out time, then subtracting the manufacturer's rating of First Copy Time.

There are two slightly different tests, depending on copier speed. The differences have been established to encourage the development of copiers for which users will typically experience a maximum recovery time of 10 seconds during a typical work day. It is possible that warm up times and recovery times after extended delays might be somewhat longer.

For the lower part of the medium-speed range (30 – 44 cpm), copiers are assumed to be left idle for longer periods during typical work days. In order to most closely replicate a user's

experienced recovery time, the delay time before measuring recovery for these lower-speed copiers is set at two hours.

For copiers in the upper end of the medium speed range (45 cpm or faster), it is assumed that they are in active use for a greater portion of the work day (left idle for shorter times), and therefore a shorter delay period of 30 minutes is allowed before testing recovery time. This shorter delay period is calculated in order to allow for some heat retention so that manufacturers may design a “Copier of the Future” that is ready to copy within 10 seconds during a typical work day.

Recovery may be started by any physical interaction with the copier, including placing the document on the feeder, pressing any key, or lifting the platen cover. Manufacturers should provide users with information on which interactions will stimulate recovery from ZESM. This test method incorporates the manufacturer’s standard calculation of First Copy Time, based on Section 9.4 of ASTM Test F 1318 (*Standard Test Method for Determination of Productivity Using Electrostatic Copy Machines with Various Configurations*).

1. For 30 – 44 cpm copiers

The copier shall be plugged in and left idle for 12 hours in order to reach ambient temperature. After 12 hours, make 50 copies in simplex mode to bring the copier to its fusing temperature. After making the copies, allow the copier to remain idle and enter ZESM (sleep mode). Exactly two (2) hours after the last copy has exited the copier, the tester shall activate copier recovery by placing a single-page document on the platen and pressing the start key for one simplex copy. Record the exact time (or starting a stopwatch or timer) of the intervention (either lifting platen or pressing start key) that starts copier recovery. When the trailing edge of the copy has exited the machine, record the time again (or stop the stopwatch/timer). The recovery time is calculated as:

Recovery time = Total time (seconds) – manufacturer’s rating of First Copy Out Time (seconds)

For example, if it takes 14 seconds from pressing the start key to the exit of the paper from the copier, and the manufacturer’s rating of First Copy Out Time is 4.6 seconds, the recovery time is calculated as $14 - 4.6 = 9.4$ seconds.

2. For 45+ cpm copiers

The copier shall be plugged in and left idle for 12 hours in order to reach ambient temperature. After 12 hours, bring the copier to its fusing temperature by making 100 copies in simplex mode of a one-page document. Exactly 30 minutes after the last copy has exited the copier, the tester shall activate copier recovery by placing a single-page document on the platen and pressing the start key for one simplex copy. Record the exact time (or starting a stopwatch or timer) of the start of recovery through lifting the platen or pressing the start key (depending which starts recovery for the machine). When the trailing edge of the copy has exited the machine, record the time again (or stop the stopwatch/timer). The recovery time is calculated as:

Recovery time = Total time – manufacturer’s rating of First Copy Out Time

7.0 Evaluation of Bids

7.1 Jury

The Copier of the Future panel has assembled a jury comprising representatives from each of the participating countries, who will define the final specifications, respond to industry questions, and evaluate the entries. This multi-party panel was established to ensure neutrality in the evaluation of bids.

The jury will retain the strictest confidentiality throughout the project period. This confidentiality includes respecting the proprietary nature of any documentation submitted by manufacturers in response to the call for entries. Further, confidentiality means that no industry participants' names will be made public unless they are announced as winners or notify the jury that they would like to be named as participants.

When developing the specifications and in product evaluation, the jury may rely on technical experts in the field of photocopier technology.

7.2 Submission of Entries

In order to qualify for evaluation in the Copier of the Future project, participating manufacturers must submit:

- Detailed technical description of prototype copier, including illustrations (particularly of fusing mechanism and control panel). Technical description should cover digital scanning capabilities, default time to ZESM and recovery time/time to first copy. Since manufacturers are not required to ship their actual prototypes, it would be helpful to include photographs of the prototype copiers.
- Marketing plan, including estimated time when products will reach specific end markets, and estimated sales price. Note that leading buyers in the following countries will be interested in purchasing or leasing winning models: Finland, The Netherlands, Sweden, Switzerland, United Kingdom, and the United States. Commercialization plans for those countries will be of particular interest to the jury.
- Documentation of test results for copier speed (simplex and duplex modes), standby mode energy consumption, and recovery time/time to first copy. Manufacturers are requested to ensure that the test results accurately reflect copier performance that customers will experience, and therefore may need to repeat the test several times to ensure reliability.

See Section 7.4 for detailed reporting formats that participating manufacturers may use.

7.3 Evaluation Process

The project, launched in September 1998, will allow up to a total of two years for manufacturers to design prototypes that meet the specifications and an additional year for market-ready copiers.

In the event that any manufacturers complete their design and prototype in advance of the two-year deadline (September 30, 2000), the jury will accept submissions every six months after project launch and will announce any copier models meeting the specifications three months after submissions. Participating manufacturers are invited to continue to complete and submit designs even if early award winners are announced. Multiple awards are permitted, as different prototypes are likely to fall into different speed categories or appeal to varying end markets. Individual manufacturers may also submit multiple entries if they are designing products in different speed ranges or for different end markets.

Entries will be evaluated based on their qualifications according to the specifications. ***All copiers that meet the specifications will receive the IEA-DSM Award of Excellence.***

Although this project evaluates copiers on the basis of the specifications, it is assumed that manufacturers will undertake designs that also address buyers' other critical concerns — price, image quality, ease of use, user-friendly control panel, etc — in order to achieve long term market success.

If multiple entries are received, the jury may choose to single out one model that offers superior characteristics, such as exceeding the energy efficiency specification or attaining all the specifications in the high end of the medium speed range. In such a case, the jury may choose to award that copier the *IEA-DSM Champion* designation.

The designations of IEA-DSM Award of Excellence and IEA-DSM Champion are intended to offer special recognition to copier models and copier manufacturers that achieve new levels of energy efficiency. Manufacturers are encouraged to mention these awards and designations in marketing and promotional materials, consistent with and in addition to any other energy or environmental achievements.

7.4 Manufacturer Reporting Sheets

Following are data reporting sheets that manufacturers may use when submitting their prototype information. Alternatively, manufacturers may use their own formats, as long as all relevant data are provided.

Reporting for Technical Description

There is no specified reporting format. However, manufacturers are requested to submit:

- Illustrations (photographs of copier and schematic diagram of fusing mechanism)
- Description of imaging technology used
- Description of toners used
- Description of paper path for simplex and duplex modes
- Dimensions, weight, power requirements
- Memory and upgrade options (if applicable)
- Any additional information deemed pertinent by the manufacturer

Reporting for Marketing Plan

There is no specified format. Manufacturers are requested to submit a narrative description of:

- Intended end markets (countries)
- Timing of market introduction for those countries
- Whether copier will become part of main product offering
- Marketing efforts planned (related to or separate from IEA-DSM promotions)
- Estimated price range, with comparison to comparable products on the market

Reporting for Test Results

See attached reporting forms.



Copier of the Future
MANUFACTURER SUPPLIED SPECIFICATIONS

Manufacturers are requested to complete and submit this summary with their project entries.

Speed (monochrome, A4 or 8.5" x 11")	_____ cpm
Sleep mode (ZESM) power	_____ Watts
Default time to sleep mode	_____ seconds
Recovery time from sleep mode	_____ seconds
Duplex speed (as % of simplex speed)	_____ %
Duplexing unit included	Y / N
Duplex copying mode set as default	Y / N
Duplex-compatible document feeder	Y / N
Counter: number of images, included	Y / N
Counter: number of duplex images (or sheets of paper), included	Y / N
Copier compatible with $\geq 25\%$ recycled-content; $\geq 70 \text{ g/m}^2$ (18 lb.) paper	Y / N
Network Compatible	Y / N
Option for multifunction capabilities	Fax (Y / N), Print (Y / N)



Copier of the Future **MANUFACTURER TEST RESULTS**

Manufacturers participating in the Copier of the Future project may either use this sheet to report test results or provide test results in manufacturer's preferred format.

Test 1. Copier Simplex and Duplex Speed

Simplex Speed: Original document (10 sheets, 1:1 mode)

A. Total job time _____ seconds

B. Simplex speed _____ images/minute

Calculate line item B: $60 / (\text{Total job time, A} / 100 \text{ total images})$

Duplex Speed: Original document (10 sheets, 1:2 mode)

C. Total job time _____ seconds

D. Duplex speed _____ images/minute

Calculate line item D: $60 / (\text{Total job time, C} / 100 \text{ total images})$

Test 2: Zero Energy (Sleep) Mode Energy Consumption

A. Starting Watt-hour meter indication _____ Wh

B. Watt-hour meter indication after one hour _____ Wh

C. Difference (B-A) _____ Wh

D. Sleep mode energy consumption (C/1 hour) _____ Watts

Test 3: Recovery Time

A. Time of recovery start _____ (time, or reading on stop watch)

B. Time of copy exit from machine _____ (time, or elapsed time on watch)

C. Total time from intervention to copy exit (B - A) _____ seconds

D. Manufacturer's rating of First Copy Out Time _____ seconds

E. Recovery time (D - C) _____ seconds

8.0 Project Schedule

September 22, 1998	Procurement Launch (Request for Bids and Requirements Finalized)
March 31, 1999	Prototypes from manufacturers accepted ⁹ ; Report from selected leading buyers released
June 30, 1999	Announcement of and award presented to 1 st round winners (if any) ¹⁰
September 30, 1999	Prototypes accepted; update on procurement project issued
January 15, 2000	Announcement of and award presented to 2 nd round winners (if any)
March 31, 2000	Prototypes accepted
June 30, 2000	Announcement of and award presented to 3 rd round winners (if any)
September 30, 2000	Final round of prototypes/bids accepted
December 15, 2000	Announcement of all winning bids; press and leading buyers invited
September, 2001	All winning copiers to be available to leading buyers, additional markets

9.0 Leading Buyers

Following is the text of a sample letter of intent that leading buyers will sign, followed by country lists of the leading buyers and project supporters identified to date. Leading buyers express their intent to purchase or lease copiers that meet the project specifications when they are available on the market. Some leading buyers have added company-specific requirements. Project supporters publicly declare their approval of the project goals and will help to distribute project information, including the list of manufacturers receiving the IEA-DSM award.

⁹The copier procurement project will accept manufacturers' documentation of prototypes meeting project requirements every six months; winning bids will be announced within three months after submission of documents.

¹⁰Announcements of winning bids at any interval will be made at a press conference with advance notice of time and location provided to all interested parties.



[Sample]
Copier of the Future
LEADING BUYER LETTER OF INTENT

Background

The Innovative Copier Procurement Project takes place in the framework of the International Energy Agency's DSM Agreement Annexe III. The purpose of the project is to identify leading buyers in each of the participating countries, define their requirements for a new generation of energy-efficient copiers, and to speed up the market introduction of a highly energy efficient medium-speed copier with superior performance characteristics. With a clear specification of the needs of important market actors, there is less risk to manufacturers and suppliers when launching new products on the market.

Participating countries are: Finland, Korea, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States.

Statement of Intent

[Organization name], in order to stimulate the introduction of an innovative, energy-efficient copier, intends to purchase or lease photocopiers that meet the requirements of the Annexe III copier procurement project. The copiers shall meet the following specifications:

- Medium Speed copier (30 - 60 cpm)
- Maximum of 10Watts in sleep mode
- Recovery time: 10 seconds from sleep mode
- Duplexing: fast (75 - 90% as fast as simplex speed); acceptable reliability
- Network-compatible and upgradable to multiple functions (e.g., fax, scanning, printing)
- Capable of handling at least 25% post-consumer recycled content paper

In addition to the above common requirements, **[Organization name]** also [requires/prefers] that the copier : [Items to be customized by each leading buyer]

Example:

Also meets energy/environmental labeling requirements (e.g., Energy Star, Blue Angel, etc.); preferred vendor; service requirements, etc.

Signature, Date
Printed Name
Company, address, contact information

Declaration in Support of the Innovative Copier Procurement Project by the Swiss Leading Buyers and Supporters

The undersigned companies and organisations have participated in the preparation of the specifications for the Innovative Copier and, with their signature, pledge their active support of the future market introduction and market penetration of the Innovative Copier.

The support by the Leading Buyer consists of:

- Declaring publicly the intention to consider the Innovative Copier explicitly in regular purchasing as soon as it is available on the market
- Communicating internally the participation in the Procurement Project
- Taking actions inside the company to promote the Innovative Copier

The Supporters, public and private organisations that are not important purchasers of copiers show their support by signing this declaration, and ñ those organisations whose members are potential purchasers ñ pledge their members to become a Leading Buyer.

In addition to the specifications stated in the Competition Documentation, the Swiss Leading Buyers and Supporters require the Innovative Copier to be in compliance with the specifications of the Blue Angel, particularly regarding the use of recycled paper.

Echallens and Zurich, September 18, 1998

Leading Buyers:

- Credit Suisse
- Migros-Genossenschafts-Bund
- Swiss Reinsurance Company
- UBS AG

Supporters:

- Swiss Energy 2000 Program
- Swiss Association for Environmentally Conscious Management (¯bu)



Copier of the Future **LEADING BUYERS AND SUPPORTERS**

Following is the list of leading buyers and supporters committed to the project to date. Leading buyers have provided project managers with letters signaling their intent to purchase or lease copiers meeting the project specifications. In some cases, country project leaders plan to expand efforts to solicit leading buyers when the market availability of the Copier of the Future draws closer. In all cases, project leaders intend to expand the national lists of leading buyers by the final project deadline, focusing on government, banking and insurance industries, copy service centers, and other key sectors. Therefore, it is anticipated that the list of leading buyers will expand substantially by the time the copiers are available on the market.

Finland

There are no specific leading buyers and supporters participating in the project to date. However, throughout the project preparation stage, there have been several contacts with potential buyers.

The Leading Buyers and Supporters will be collected by MOTIVA, the country project manager for Finland, starting after the Procurement Launch. The project will be connected to the National Comprehensive Energy Conservation System. In this system, among other energy efficiency measures, companies and organizations make a commitment to support the market penetration of energy efficient technologies. This means, for example, participation in buyer groups for technology procurement projects.

The Netherlands

The Dutch country manager, Novem (Dutch Agency for Energy and Environment) has contacted the following leading buyers, who have signed their own versions of the enclosed sample letter of intent:

- Ministerie van Economische Zaken
- Nederlandse Philips Bedrijven B.V.
- Rabofacet
- Delta Lloyd Verzekeringsgroup NV

Sweden

The Swedish country managers, representatives of the University of Dalarna and Board of the Swedish National Energy Agency, have contacted the following companies, who have expressed strong interest in participating in the project as leading buyers:

- Ericsson
- Ikea

- Stora
- Tetra
- Volvo

Switzerland

The Swiss country participant, representatives of the Energy Analysis Research Group at ETH (a Swiss technical university) have developed agreements with leading organizations who will serve as either leading buyers or supporters of the project. Leading buyers intend to purchase or lease copiers that meet the project specifications, as well as additional environmental criteria, when they are available on the market. Project supporters are pursuing complementary efforts and will assist in the dissemination of information about the project and copiers meeting the specifications.

Leading Buyers:

- Credit Suisse
- Migros-Genossenschafts-Bund
- Swiss Reinsurance Company
- UBS AG

Supporters:

- Swiss Energy 2000 Program
- Swiss Association for Environmentally Conscious Management (bu)

United Kingdom

The list of prospective buyers in United Kingdom is based on verbal expressions of interest. Building Research Establishment, Ltd, the country project manager for the United Kingdom, will obtain further expressions of intent (including signature of a letter of intent) as manufacturer participation and product launch dates for the United Kingdom become clearer.

- AA (motoring and insurance)
- British Airways
- Birmingham City Council
- Carlisle City Council
- General Accident Insurance
- Halifax Building Society
- Independent Insurance
- Marks & Spencer Plc
- Prudential Assurance Co.
- Sainsburys
- Stationery Office
- TSB Purchasing
- Wragge and Co., Birmingham

United States

The U.S. country managers, representatives of the U.S. Environmental Protection Agency, have contacted the following organizations that have expressed strong interest in participating as leading buyers, and in several cases, have already signed letters of intent:

- BankAmerica
- Boeing Company
- Kinko's
- Lawrence Berkeley National Laboratory
- Minnesota Mining and Manufacturing (3M)
- State Farm Mutual

In addition, the U.S. plans to work with federal government purchasers of photocopiers where agencies are particularly interested in purchasing energy-efficient office equipment, particularly within the Environmental Protection Agency, Department of Energy and its affiliated laboratories, and the U.S. Postal Service.

Throughout the project period, the country managers will continue to build demand for the *Copier of the Future*, working more closely with prospective leading buyers as the market availability date for each country draws closer. The country managers also intend to work with dealer networks to ensure that they are aware of this project and will make the copiers available to interested buyers.

10.0 Project Award

There are two main components to the award planned for manufacturers who submit copier models that meet the specifications: one is the opportunity for publicity and international recognition with the designation of their models as earning the IEA-DSM Award of Excellence or IEA-DSM Champion designation; the other is the opportunity to sell or lease the copier to an assured and ready international market. The awards will be announced and presented at appropriate venues, such as international office equipment or energy-efficiency conferences. Press and copier buyers will be invited to attend awards presentations.

The publicity to be offered to manufacturers who meet the project specifications includes announcements at appropriate conferences and international venues, press releases to and articles in trade journals and mainstream media, and other efforts within the participating countries of the copier project team. In addition, manufacturers are permitted and encouraged to conduct their own public relations highlighting their designation of excellence by the International Energy Agency, an award granted to very few companies or products. Procurement project managers will also undertake efforts to encourage leading buyers to conduct similar public relations efforts, highlighting both their own roles and the winning companies and products.

Regarding leading buyers, the project managers will continue to sustain and build the market for leading buyers throughout the project period. Therefore, the list noted in section 9.0 will likely be expanded by the time the winning copiers are announced. While the long lead time poses some challenges in sustaining buyer interest for a prolonged period, it also allows buyers to plan for copier replacement with the “Copiers of the Future”, and to enter new purchase or lease arrangements when the copiers are on the market.

Questions/Contact Information

If there are any questions or comments about this document or the project, please submit your questions in writing to:

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All questions will be posted anonymously, with responses, on the project web site:
<http://www.epa.gov/appdstar/esoe/techpro.html>